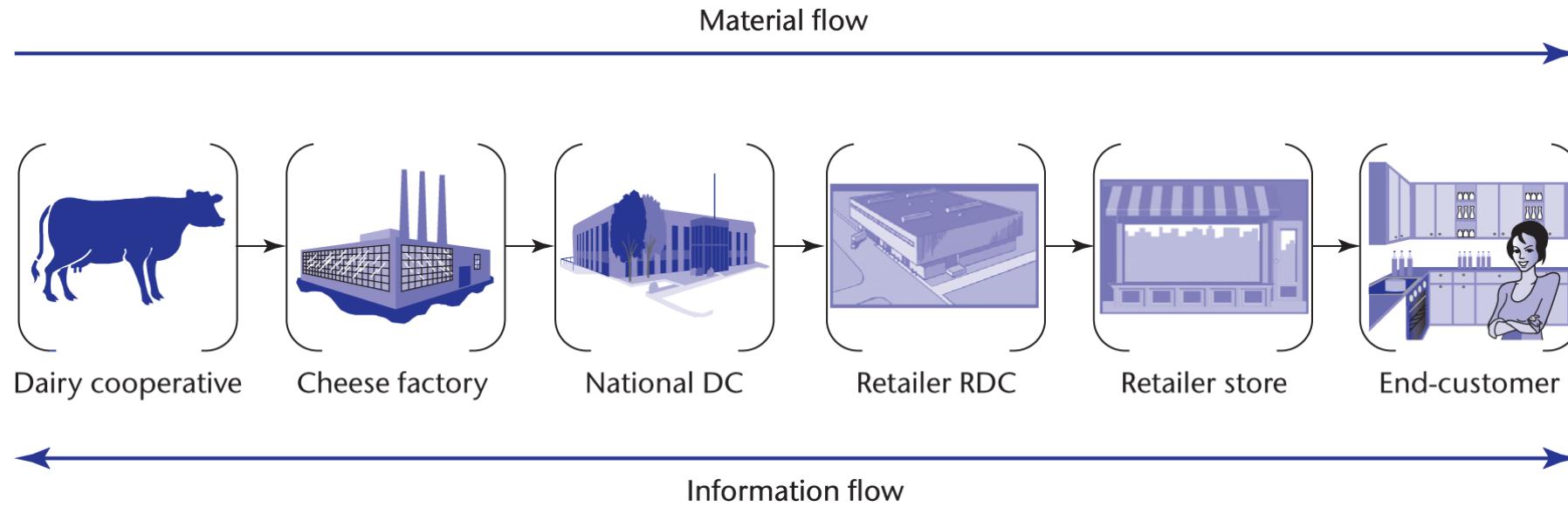


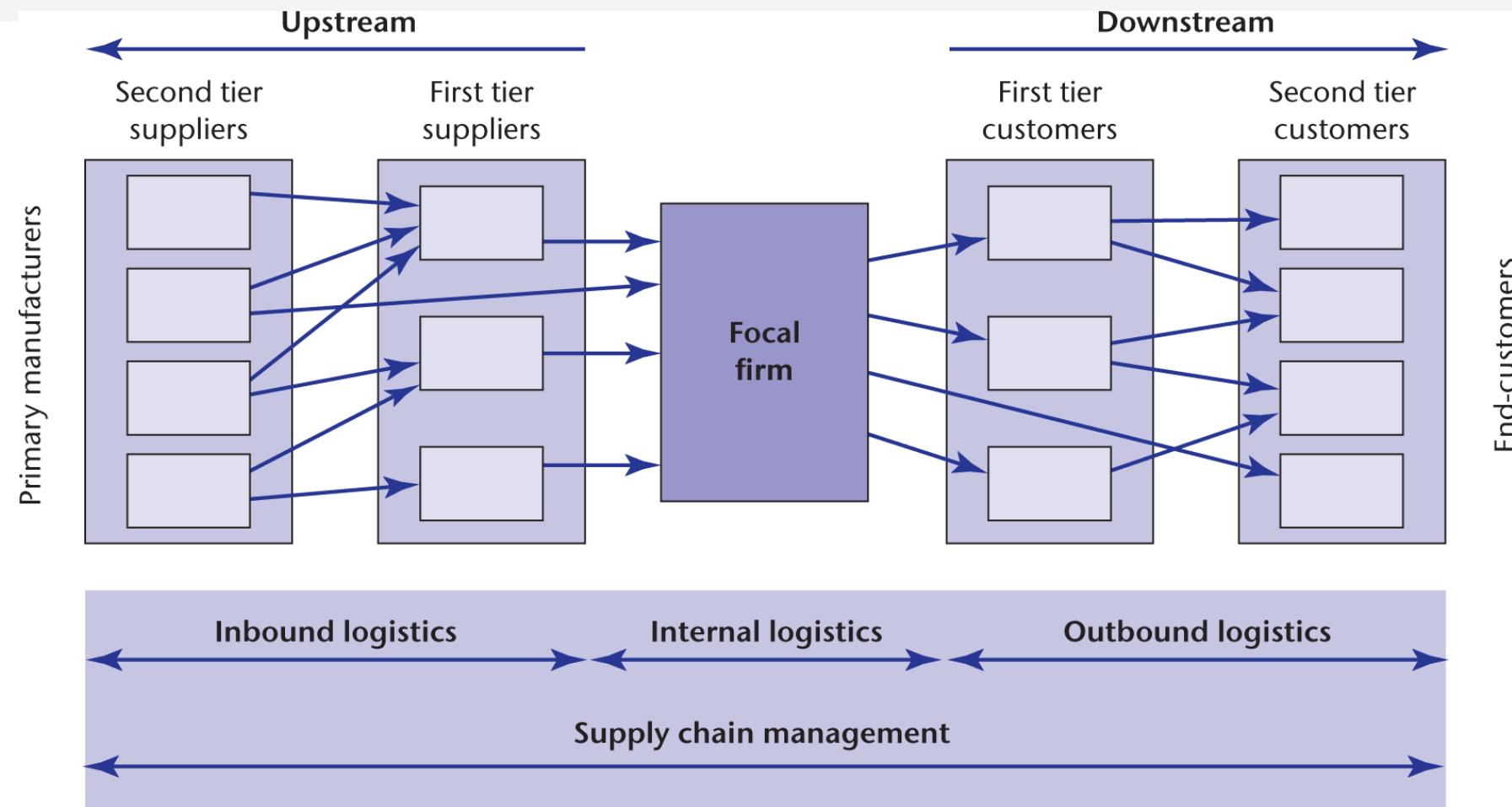
Forward, Reverse and Last Mile Logistics



Material Flow – from Cow to Customer



Supply network



Global supply chains

Supply chain issues for ‘today’

- The customer service explosion (quality, cost of delivery)
- Time compression (speed of fulfilment)
- Globalisation of production (sourcing worldwide)
- Organisational integration (technological developments)

Q, C, D



What's changing and what will it mean?



Outsourcing /
Re-shoring

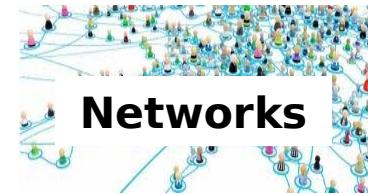
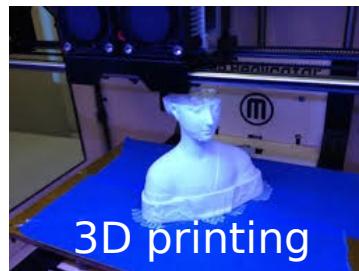


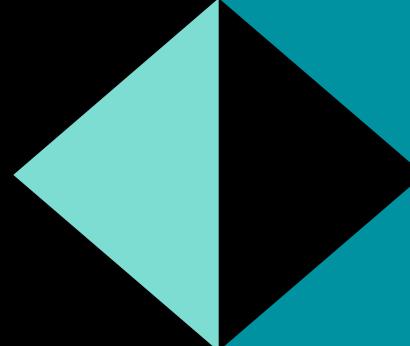
$$\begin{aligned} \partial \theta^M T(\xi) &= \frac{\partial}{\partial \theta} \int_{\xi_1}^{\xi} f(x) f(x, \theta) dx = \int_{\xi_1}^{\xi} \frac{\partial}{\partial \theta} f(x, \theta) dx, \\ \frac{\partial}{\partial \alpha} \ln f_{\alpha, \sigma^2}(\xi_i) &= \frac{(\xi_i - \alpha)}{\sigma^2} f_{\alpha, \sigma^2}(\xi_i) - \frac{1}{\sigma^2}, \\ \int T(x) (\partial \theta)^M &= \int_{\xi_1}^{\xi} T(x) \frac{\partial}{\partial \theta} f(x, \theta) dx, \\ \partial \theta^M T(\xi) &= \frac{\partial}{\partial \theta} \int_{\xi_1}^{\xi} (T(x) \frac{\partial}{\partial \theta} f(x, \theta)) dx = \int_{\xi_1}^{\xi} \frac{\partial}{\partial \theta} (T(x) \frac{\partial}{\partial \theta} f(x, \theta)) dx. \end{aligned}$$

Algorithmic decision-making



*big
data*



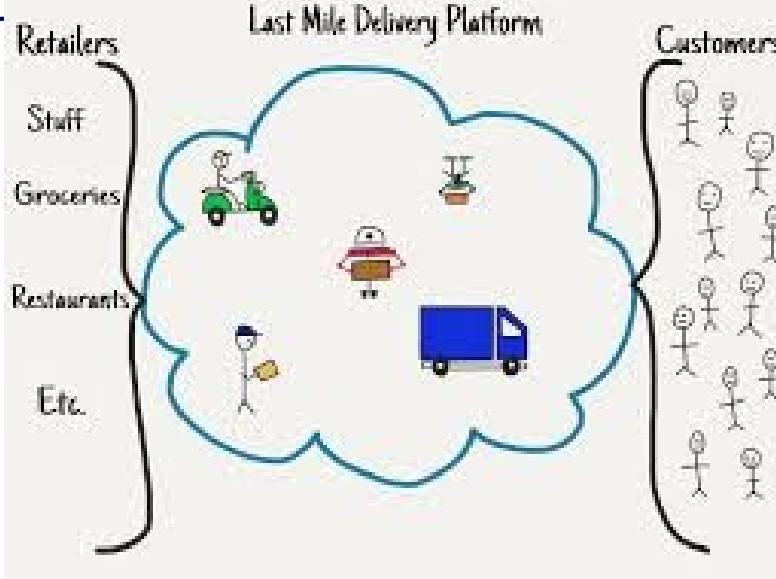


Last Mile Logistics

The last mile



The last mile may be defined as the final leg in a business-to-consumer delivery service whereby the consignment is delivered to the recipient, either at the recipient's home or at a collection point.



Expectations



What does fast shipping mean to you?

How much of a premium would you pay for same day delivery?

What are the costs of last mile delivery?

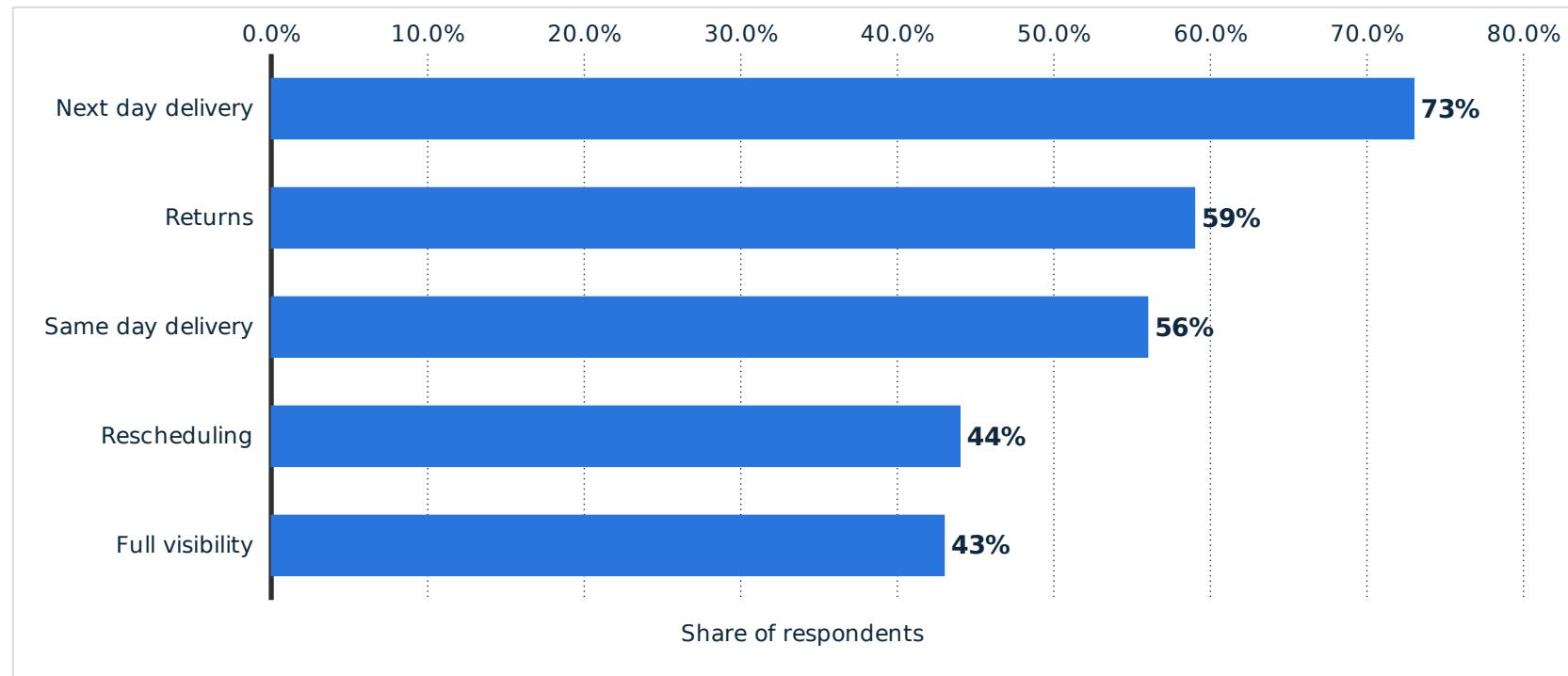
As a share of the total cost of shipping, last mile delivery costs are substantial — comprising ??% overall.

And with the growing ubiquitousness of “free shipping,” customers are less willing to foot a delivery fee, forcing retailers and logistics partners to shoulder the cost. As such, it’s become the first place they’re looking to implement new technologies and drive process improvements.



Which services do you currently provide for your last mile customers?

Main services provided for last mile delivery 2017



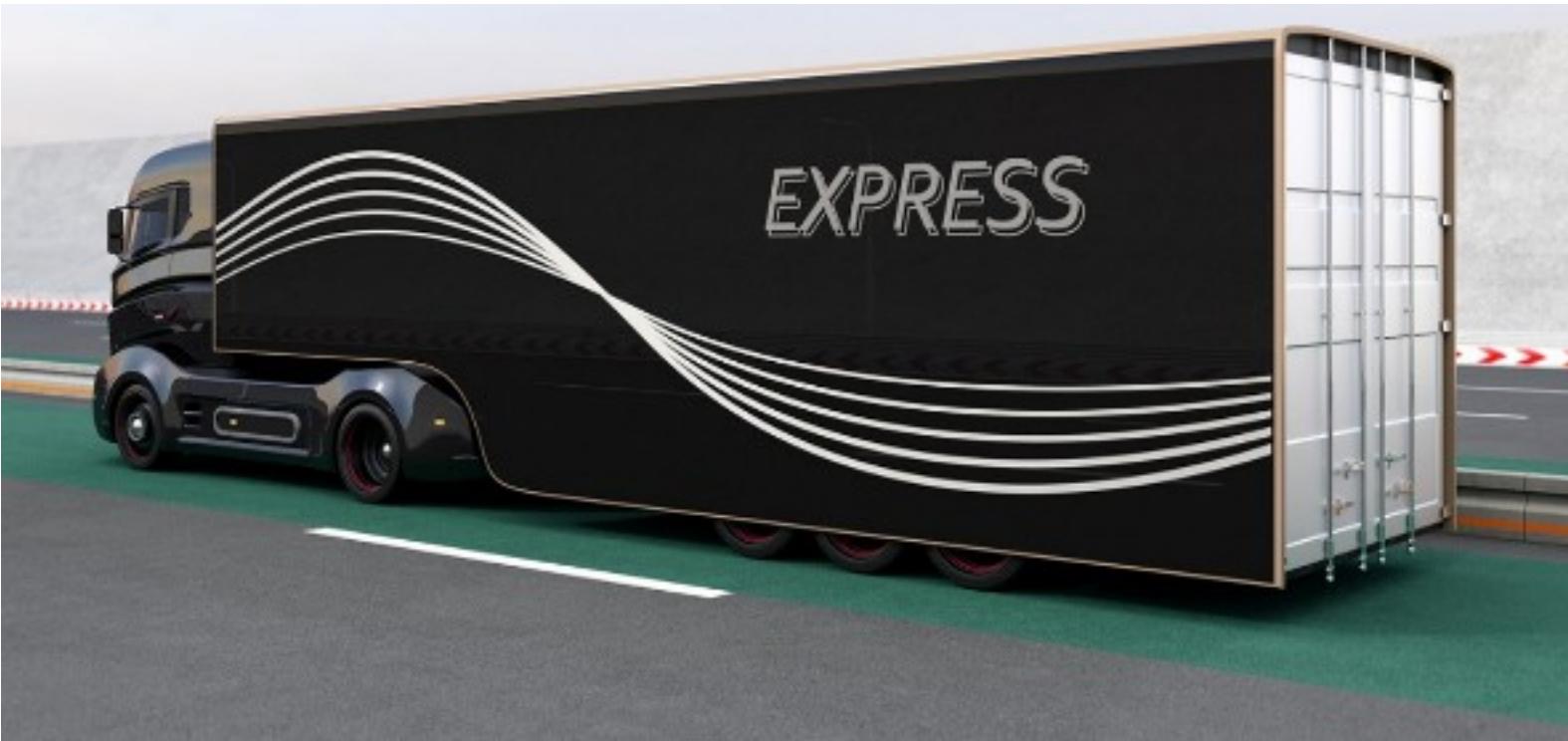
Note: North America, Europe; 2017; 323 Respondents; 194 logistics executives and 129 supply chain executives from retail.
 Further information regarding this statistic can be found on page 58.

Source(s): eft Supply Chain & Logistics Business Intelligence; Localz; NKF; [ID 817203](#)

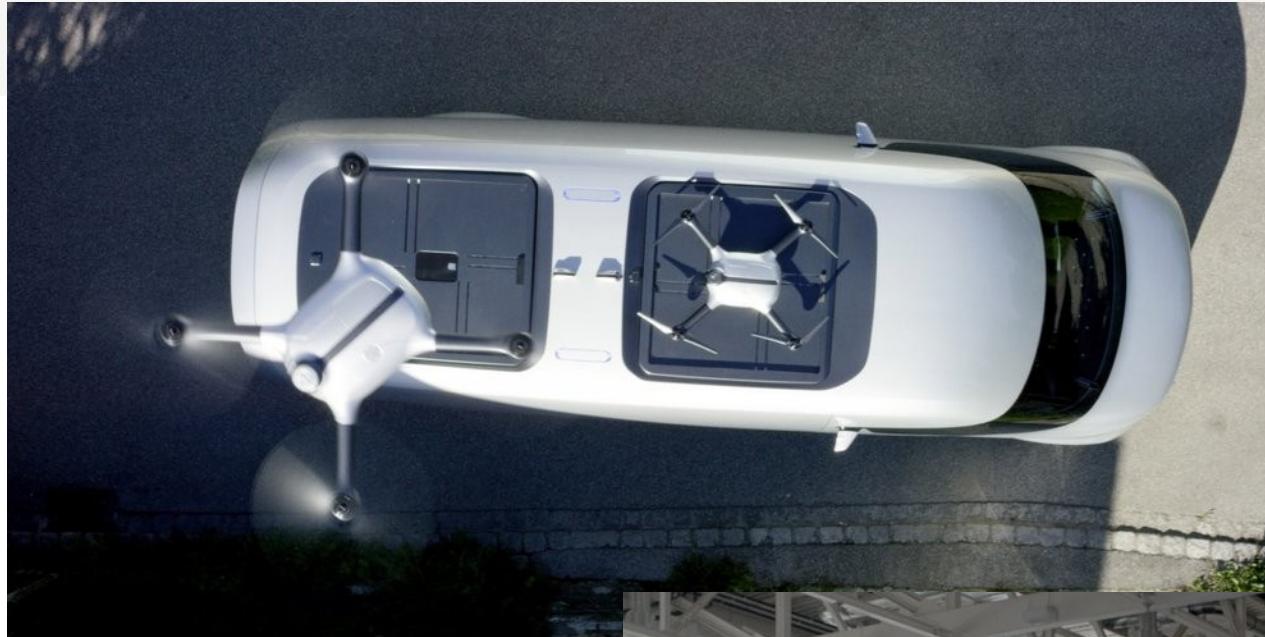
The last mile



Last mile delivery



The future of last mile deliveries



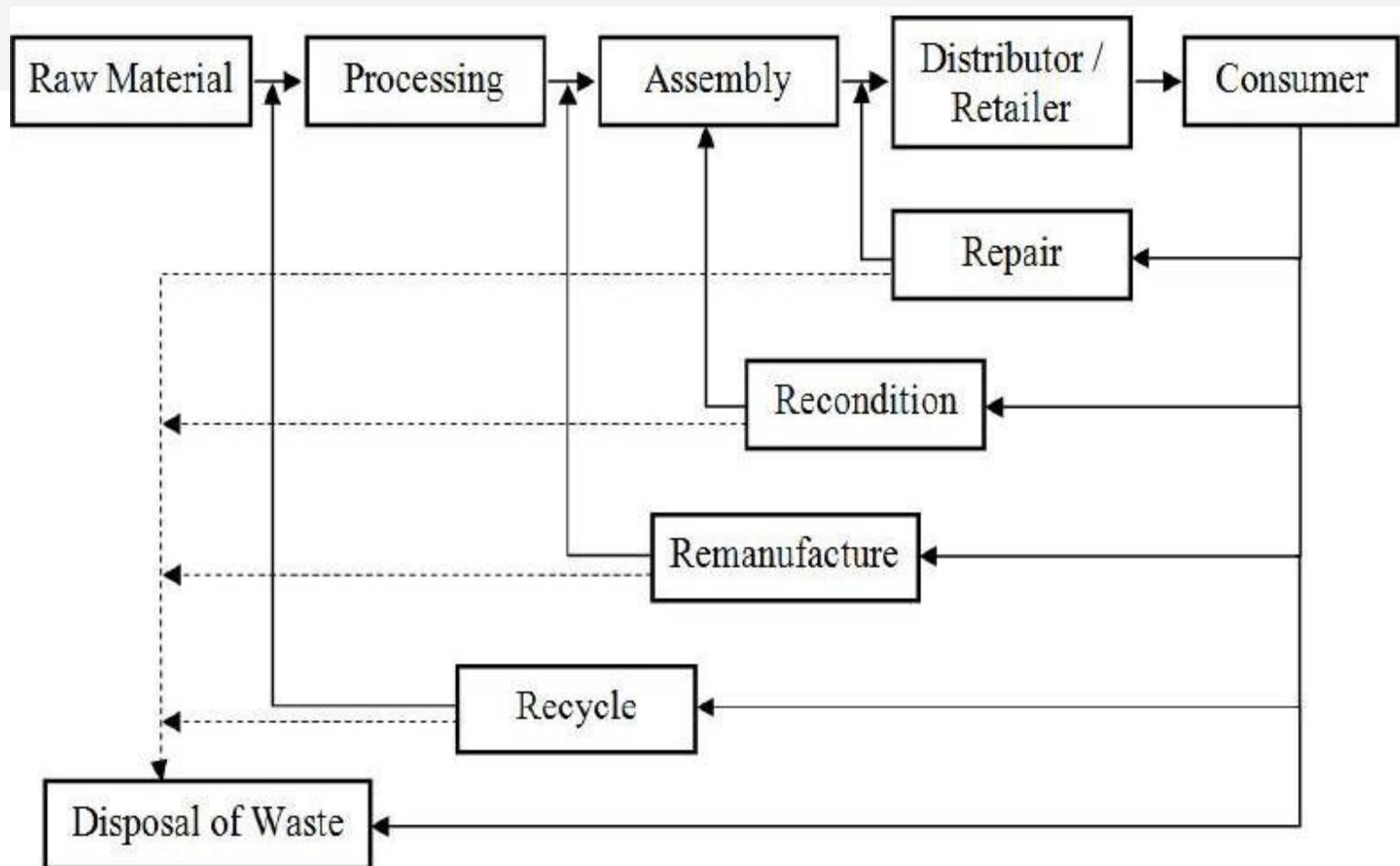
Reversing the Supply Chain

Reverse Logistics



UNIVERSITY OF
SURREY

Reverse logistics and closed loop supply chains



Read Govindan et al., (2015) for a full review of the literature

Govindan, K., Soleimani, H. and Kannan, D., 2015. Reverse logistics and closed-loop supply chain: A comprehensive review to explore the future. *European Journal of Operational Research*, 240(3), pp.603-626.

What is reverse logistics? (MIX AND MATCH)

- | | |
|---------------------------|---|
| 1. Returns | a) the use of durable packaging that is reused by continuously returning it backwards in the supply chain. |
| 2. Returns Avoidance | b) reconditioning used goods for resale. |
| 3. Remanufacturing | c) accepting goods at the end of their life for reuse and recycling. |
| 4. Refurbishing | d) returning things to the producer for repair and maintenance. |
| 5. Packaging | e) building products with a combination of reused, repaired and new parts. |
| 6. Unsold Goods | f) handling customer returns of goods such as claims under a warranty. |
| 7. End-of-Life | g) processes that seek to minimize returns such as support websites or local repair shop partners. |
| 8. Delivery Failure | h) in some cases, unsold goods may be returned by distribution partners according to the terms of their contract. |
| 9. Rentals & Leasing | i) customers returning things that are on loan such as an equipment rental. |
| 10. Repairs & Maintenance | j) deliveries that don't complete such as refusal of delivery by customers. |

What is reverse logistics (1)

- Returns
 - Reversing the flow of products from their point of destination back to a point of origin or reverse logistics center.
- Returns Avoidance
 - Reducing the volume of returns through better product design, improved packaging, and effective distribution.
- Remanufacturing
 - Reusing parts of old products to create new ones.
 - shop partners.
- Refurbishing
 - Reusing, repairing and new parts.
- Packaging
 - Redesigning packages to be more sustainable and easier to recycle.
- Unsold Goods
 - Managing surplus inventory through various channels like donations, discounts, or repurposing.

What is reverse logistics (2)

- End-of-Life

recycling.

- Delivery Failure

such as refusal of delivery by
customers

- Rentals & Leasing

customers returning things that
are on loan such as an

- Repairs &
Maintenance

returning things to the
producer for repair and

Return Policies and impact

- » 82% of those surveyed are likely to complete a sale if you offer a free return shipping label and in-store returns
- » 68% are likely to complete a sale if you just offer the free return shipping label
- » But, only 20% are likely to complete the sale if you offer no in-store shipping and the buyer pays return shipping
- » 66% of your customer will look at your return policy before they make a purchase

Poorly managing your returns can increase your costs

Profitable RL solutions ?

- » Accepting used items to be disassembled and sold for parts.
- » Taking in older items to be refurbished and resold at a lower price point.
- » Reselling items in a secondary market
(may not be as valuable as new product but profitable nonetheless).



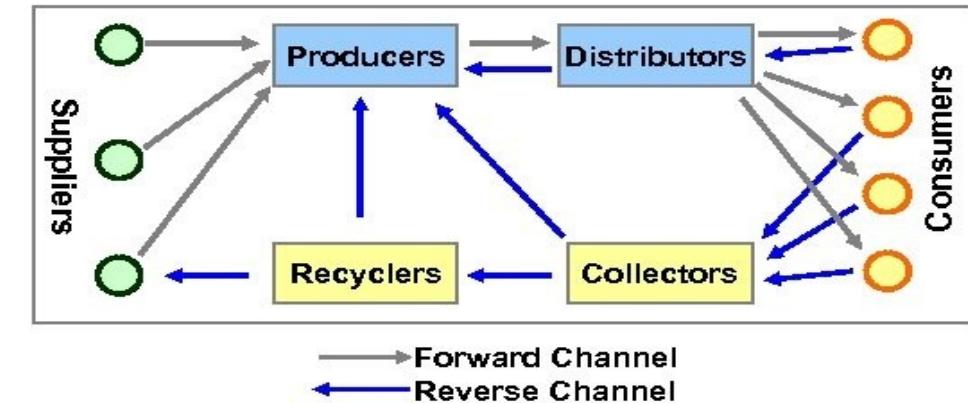
ebay



Reverse Exchange – Would you?



Forward and Reverse Distribution



Challenges of managing RL compared to managing forward logistics

Reverse logistics carries its own unique challenges and difficulties:

- It's largely unplanned and unpredictable, where forward logistics is typically very intentional.
 - There are different levels of what you could consider reverse logistics (it's more than simply "returns").
 - It can be largely undocumented, where forward logistics usually has a detailed paper trail.
 - Reverse logistics can have less obvious impact on the bottom line than forward logistics typically does.
 - Don't just assume that because you can handle your forward logistics, you are doing a good job with reverse logistics. Assess your operation honestly and suspiciously.
- Outsource RL to increase profitability?**

What are the barriers of reverse logistics?

The key barriers to RL are:

- Lack of a business case, in particular for lower cost/value items
- Lack of incentives
- Lack of regulation
- Complexities of take-back channels
- Lack of ICT/EDI systems to manage returns
- Lack of understanding of business cases and best practices
- Lack of RL knowledge and expertise
- Lack of collaboration along the supply and value chain
- Lack of a standard for recycled materials (product ‘passport’)
- Lack of larger global market place for EoL products and recycled materials

Therefore, often management prioritises other topics over RL

Developing Country Barriers

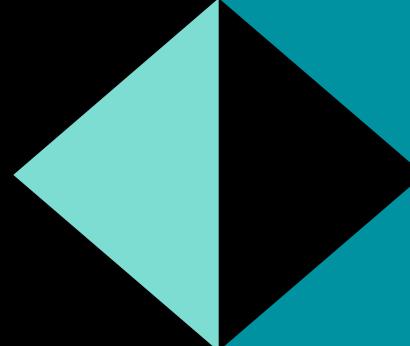
In developing countries the following barriers can be added:

- » Lack of awareness of the topic
- » Lack of awareness of regulation
- » Lack of law enforcement
- » Lack of management and operational capability
- » Situation differs also by sector and product category

What can we do?



Design for life
Circular economy
Life cycle assessment
Product stewardship
Extended producer responsibility



Greening Production

Green Operations and Logistics

• Production System

- Layout of Production
- Efficiency of Materials handling
- Storage Systems
- Can products be dissembled / returned / recycled after use
 - Focus on development and design from start



• Distribution System

- Consolidated,
- Return Flows
- Route and Load Planning
- IT
- Vehicle Design return



• Packaging

- Design
- Material
- Purpose

Sustainable Distribution Centres

- » 60% more energy efficient
- » Hydrogen fuel cells in materials handling vehicles
- » Wind Turbines
- » Solar Panels
- » LED lighting
- » Ammonia V's Freon refrigeration
- » White roof membranes
- » Floors made of Fly Ash
- » Light reflecting flooring



Green Operations Examples



Highlights: Plan A 2025 Commitments



By 2022, all M&S product packaging will be 'widely recycled'



We will reduce greenhouse gas emissions by 80% in our own operations by 2030 (compared to 2007 levels) and, during the same period, cut emissions in our supply chain by 13.3m tonnes



By 2025 all edible surplus food from M&S stores and direct food suppliers will be redistributed to charities



Between 2017 and 2025 we will help raise £25 million for charities that support people affected by cancer, heart disease, mental health, loneliness and dementia



By 2025 all key raw materials M&S uses will come from sustainable sources, including all the cotton we use by 2019



By 2025 50% of our Clothing, Home and Food stores and offices will make space available for community groups and charities



By 2020, in 10 locations we will have completed programmes that aim to secure meaningful economic, social and environmental benefits in the communities around our stores. We'll roll out to 100 locations by 2023 and share learnings with 1,000 locations by 2025



By the end of 2018 all single portion snacks, confectionery and ice cream will be less than 250 calories



We aim to halve food waste from M&S stores by 2025



Between 2017 and 2025 M&S colleagues will complete a million hours of work-time community volunteering



Half of M&S Food sales will come from healthier products by 2022



Over the next seven years our Global Community Programme will help a million people in our supply chain communities to help build livelihoods and protect the environment